CALFED GAME 4
Year   1981

	CVP Accounting						

	Upstream Balance			Export Balance			
	Increased Releases	Reduced Releases (negative	WQCP Impacts	Total Cuts	Increased Pumping (negative	WQCP	Section 3 Exports	Section 3 Export Cuts
October								
November								
December								
January								
Oct - Jan Subtotal	0	0	0	0	0	0	0	0
February								
March								
April								
May								
June								
July								
August								
September								
Feb - Sep Subtotal	0	0	0	0	0	0	0	0
Totals	0	0	0	0	0	0	0	0

B(2) Accounting

WQCP Upstream	0
WQCP Exports	0
Net WQCP	0
Net Upstream b(2) released	0
Net Discretionary export b(2) except Section III	0
Total Net export b(2) except Section III	0
Section 3 water exported	0
Gross Upstream fish actions	0
Gross Export fish actions	0
Gross Fish Actions	0
Net Feb - Sep Export reduction	0
Total b(2) Spent	0
Export cuts beyond WQCP	0

DWRSIM/ Daily Model

	SWP	CVP
SIM continuous Exports		
SIM yearly exports		
Daily Base Exports		
Daily Final Exports		
Change in Exports		
Final DWRSIM Exports		
CVP Delivery Cuts		

| EWA Accounting | | | | | | | | | |
| Upstream Balance | | Export Cuts | | | Export Supply Enhancemnts | | | | |
Increased Releases	Reduced Releases (negative	Total Cuts	E/I	500 cfs	JPOD	Demand Shift	NOD XFER	SOD XFER	SWP B(2) Exports?
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0
0	0	0	0	0	0	0	0	0	0

EWA Accounting

Upstream Releases	0
Water Backed upstream	0
Total Export Cuts made	0
Export Supplies Generated	0
E/I	0
500 cfs	0
JPOD	0
Demand Shift	0
XFER from NOD	0
SOD Purchase	0
SWP b(2) water?	0
Caarryover	
SLR	0
MWD	0
Vidler	0
Shasta	0
Folsom	0
Oroville	0

Storage
Negative values for borrowed water

Sum: EWA Export Supplies		SLR	MWD	Vidler	Shasta	Folsom	Oroville
	Initial values						
		0	0	0	0	0	0
0							
0							
0							
0							
0							
0							
0							
0							
0							
0							
0							
0							
0	Carryover						
0							
0							

CALFED Game 4
Draft Description
April 16, 2000

Purpose

Test realistic b(2)/ EWA game to assess performance w/r biological bar and water supplies.

Goal

Attempt to meet operational requirements defined by USFWS in their paper defining a need for 300 kaf of EWA assets. In general, this means meeting "A" and "B" priorities in the biological template.

Monthly Modeling

- Use DWRSIM
- 1995 LOD
- Level 2 Refuge water supplies
- Trinity River: use 369 – 815 release assumptions
- America River: Modified 893 baseline.
- B(2) baseline: D 1485

- Run model using carryover storage without EWA
  - I.e., EWA storage is not included as carryover
  - EWA debts are added assumed to be real storage.

- Run with current facilities and standards but w/ VAMP inflow patterns

Monthly Linkage to Daily Model

- Monthly Delta inflows
- Monthly State/Federal Export pumping (split out)
- Monthly upstream storage patterns (by reservoir)
- Monthly State/Federal Delivery values (split out)

Daily Modeling

- Keep separate SWP/ CVP accounts for exports and SLR.
- Make demand cuts during October – December in years following cuts
- Create baseline by matching SWP/CVP export split (i.e., use DWRSIM COA assumptions as a guide).
- Do not assume any new tools in baseline condition.

- After baseline created, turn on new tools – 500 cfs, JPOD. These tools will provide water to SWP/ CVP and to EWA. Need to be very careful in keeping account of these benefits.

Daily Linkage to Monthly Model

- Report Storage levels to DWRSIM each year. However, do not include EWA storage or debts in these reports. DWRSIM should run as if EWA storage did not exist and as if EWA debts had been paid back already.

B(2) Accounting

- All effects are "net" effects. Thus
  - Net storage change in upstream storage: October – January
  - Net change in upstream releases: February – September.
    - However, upstream "credits" can only be used created as offsets of other releases. Exports cannot be backed upstream for zero net impact unless they net out against positive releases at other times.
  - Net change in exports October – September
- Calculate WQCP impacts using all b(2) criteria: Upstream storage, releases, and exports.
- No SWP credits for windfall water. *We need to confirm this assumption. May want to assume credits for SWP pumping of AFRP water.*
- 640 kaf limit on export impacts from February – September , including WQCP export impacts.
- CVP exports cannot be cut below 5% deliveries to Agricultural Service. I.e., CVP exports cannot be cut below about 1.2 maf (check the exact number).
- Section III transfers acceptable, but use sparingly. AFRP flows should not use Section III. Export cuts should not use Section III. Use primarily to move water when b(2) account not exhausted and upstream storage allows shifting of some water across Delta.

Assets/ Sharing

Asset	EWA Share	CVP Share	SWP Share
Access to Surplus Export Capacity	50% of surplus flows. 100% of upstream releases and E/I water	50% of surplus in Banks. 100% of upstream releases	50% of surplus at Tracy. 100% of upstream releases.
San Luis Reservoir	Right to unused capacity. First to spill		
500 cfs Banks July - September	50%		50%
SOD Water Purchase	75 kaf		
NOD Water	50 kaf		

Purchase			
Demand Shifting	90 kaf.		
E/I Relaxation	100%		
Vidler Storage	100 kaf. *Need input/output information. Need to know what kind of years input/ output is allowed*		
Credit for SWP AFRP pumping?	*Needs discussion*		
400 cfs intertie	*Assume not in this game – timeline too long. Need confirmation of this.*		

The Process of Gaming

- Use b(2) account first. Apply EWA assets only when b(2) account exhausted or constrained, or when EWA water in storage is in danger of being lost. In some cases, we won't know how to charge actions until the year is over.
- CVP delivery cuts may be made in response to export b(2). CVP and SWP delivery cuts may not be made in response to EWA actions. EWA is constrained not to affect deliveries. Separating these two may be difficult. Spending b(2) before taking actions with EWA may make this easier.
- Should probably be aggressive in purchase of EWA water, even if not needed in current year.

B(2) Definitions

Reset (Storage Metric)

The upstream metric for accounting for b(2) water during the October 1 through January 31 period is based on the change in storage between the beginning and end of the period. If the January 31 storage with the b(2) fish actions in place is less than the January 31 storage without the b(2) action, the difference is chargeable to the b(2) account. If the January 31 storage with the b(2) fish actions is equal to or greater than the ending storage without the fish releases, there is no charge to the b(2) account. This accounting procedure is called "reset"

Offset (Export Reduction Credit)

When the CVP reduces the amount of Delta exports between February 1 and September 30 as part of a b(2) action, releases from upstream reservoirs may be reduced by a corresponding amount in order to minimize the water lost to Delta outflow. At the same time the b(2) account is charged for the reduced Delta export it is credited for the reduced amount of reservoir release. This accounting procedure is called "offset" or "credit". In addition, because reduction in Delta exports resulting from meeting the WQCP are charged to the b(2) account, any reduction in reservoir releases resulting from meeting the WQCP are also credited (up to 195 TAF) to the b(2) account.

State Gain (Windfall)

When the CVP makes upstream b(2) releases, the CVP cannot always export all of that water. The SWP, however, can export the b(2) releases and therefore gains water supply. This situation is called the "State gain".

WQCP Cap

The CVP increases reservoir releases and decreases Delta exports in order to meet the WQCP. Up to 450 TAF WQCP water can normally be charged to the b(2) account. This amount is the "WQCP cap". Additional charges to the b(2) account for meeting WQCP requirements are discretionary. (Note: The State/Federal split for meeting WQCP requirements will be addressed as part of COA negotiations.)

Delta Smelt Biological Opinion

The b(2) account is charged with the difference between the CVP portion of the Vernalis base flow and the CVP portion of the VAMP allowed export plus the difference between the SWP allowed export under the Delta smelt Biological Opinion and the SWP portion of the VAMP allowed export.

GAMING SUMMARY
(Preliminary -- Subject to Revion)

b(2) Accounting	CALFED "Fed" Game	State Preference	Estimated b(2) Amounts (TAF) Wet	Dry
Reservoir Reset	YES	NO	200-350	0-100
Offset	YES	NO	200-300	0-200
WQCP Credit	YES	NO	0	0-350
SWP Gain Credit	YES	NO	0-50	0-200
ESA Credit	Discretionary	Firm	0-300	0-300
Delta Smelt	2:1	1:1	0	0-350

Baseline Assumptions

	CALFED "Fed" Game	State Preference
Level of Development	1995	1995
Refuge Water Supply	Level 2	Level 2
Trinity Flow (TAF/year)	369 - 815	?
American River	Modified 893	Modified 893
b(2) Baseline	D1485	D1485

Assets

	EWA	CVP	SWP
Surplus Export Capacity	50%	50% Banks	50% Tracy
Unused San Luis Reservoir	100%		
Banks (500 cfs)	50%		50%
Demand Shifting (pay for alternative water supply)	90 TAF		
E/I Flex	100%		
Water Acquisition	125 TAF		
Vidler Storage	100 TAF		

Other Water Supply Assets

Shasta Enlargement
Sites Reservoir
In-Delta Storage
Friant Enlargement
Groundwater Banking
Water Use Efficiency/Recycling
Land Fallowing
Conveyance

EWA Report: April 25, 2000

- Game 4:

  - 80 KAF short of full bio protection, but:
  - Not a true 50/50 JPOD
  - Imposed Risk on Projects
  - Therefore, significant new assets needed.

- EWA Strawman:

  - Make JPOD 50/50. (Better for CVP, worse for EWA).
  - Add significant water purchases and source shifting to reduce risk.

- Compared to Game 4, the EWA Strawman has:

  - Better environmental protection.
  - Higher CVP deliveries.
  - Lower risks on Projects.
  - Higher costs.

- Shifts in various baselines would shift EWA needs.

  - State preference b(2) would require larger EWA.
  - Lower Trinity flows would allow smaller EWA.
  - Change in COA would change EWA needs.

DRAFT
CALFED Staff
EWA Strawman Explanation

GOALS IN STRAWMAN DEVELOPMENT

- Meet biological needs
- Largely eliminate risk of additional supply costs to Projects
- Improve export supplies
- Cost _not_ a major criterion

EWA ASSETS INCLUDED

- See spreadsheet for complete listing
- Key assets are:
    - Access to surplus and new Project capacity.
    - Storage
    - Water purchases
    - Borrowing of Project water, provided collateral exists for payback.

EWA SIZE

- Size a function of b(2) rules, baseline assumptions, biological goals, degree of residual acceptable Project risk. Change in any items would change the needed size of the EWA.
- Average amount of water to be controlled by EWA = 473 TAF, based on analysis of 1981 – 1988. This amount is higher than the projected 400 TAF, based upon earlier CALFED gaming. Reasons:
    - B(2) rules in most recent CALFED game provide more protection for fish than the B(2) rules in the corresponding earlier CALFED games. All things being equal, the b(2) rules in the most recent game would reduce the needed size of the EWA. However,
    - The most recent game also includes higher Trinity flows and lower American River flows as baselines. Also, existence of EWA may encourage greater application of b(2) upstream to meet AFRP recommendations. End result is that the latest increases net use of b(2) upstream by 134 kaf and decreases b(2) export reductions beyond WQCP by 41 kaf, compared to earlier games. As a result, EWA target size rises from 430 kaf (derived from the previous games for 1981 - 1988) to approximately 473 kaf.
- A shift from b(2) rules in the latest game to the complete Federal preference would reduce EWA needs by about 19 kaf per year.
- A shift from b(2) rules in the latest game to the complete State preference would increase EWA needs by about 150 kaf per year.

April 26, 2000

Effects of b(2) Accounting Procedures
Based on CALFED gaming years 1981 - 1988

	Operational Gain fish **"benefit"** actually realized			
	Average of Wet Years	**Average of all Years**	**Average of Dry Years**	**Maximum Year**
Current Federal Policy	(TAF)	(TAF)	(TAF)	(TAF)
Storage Metric (Reset)	20	21	23	90
Exp. Red./Rel. Credit (Offset)	75	84	94	225
WQCP Cap	0	5	10	41
State Gain (Windfall)	20	77	132	242
ESA Debit	??	??	??	??
State Preference				
Diff. in EWA Requirement	115	188	258	

I understand that you had some questions about how I calculated
offsets.
It is quite possible that I did not do it correctly.

I restricted offsets to water backed up during discretionary export
cuts
during the game. That is, I did not include water never released as a
result of export cuts forced by regulatory shifts in meeting the WQCP.
If
you included the latter, the number would rise significantly.

	Discretionary offset only	Discretionary + WQCP
1981	0	185
1982	0	0
1983	0	0
1984	180	222
1985	37	186
1986	120	120
1987	225	356
1988	112	366
Averages	84	179

I also looked at reset, but the change is minimal.

I have attached the accounting spreadsheet. For discretionary and WQCP
offset, I looked for months with export cuts, then looked to see if
upstream releases were reduced in the same month. The offset was the
lesser of the export cut or the reduction in upstream release. THus,
you
cannot simply add up the columns labelled "offset" to get the correct
number.

B(2) Accounting

b(2) Accounting (Based on CALFED gaming years 1981 - 1988)

	Operational Gain fish **"benefit"** actually realized			
Current Federal Policy	**Average of Wet** Years (TAF)	**Average** of **all Years** (TAF)	**Average of Dry** Years (TAF)	**Maximum Year** (TAF)
Storage Metric (Reset)	20	21	23	90
Exp. Red./Rel. Credit (Offset)	75	84	94	225
WQCP Cap	0	5	10	41
State Gain (Windfall)	20	77	132	242
ESA Debit		??		
State Preference				
Diff. in EWA Requirement	115	188	258	

12/13/00

CVPIA §3406(b)(2) POLICIES

Use of Water resulting from Refill of Reservoirs (Reset)

Water which is available under the (b)(2) Policy as a result of refill of reservoirs following upstream releases ("reset") will not be used in a manner which results in increased export reductions. [Such water will be used only for upstream actions, CVP WQCP obligations, banking, or transfer.]

Upstream releases of (b)(2) water pumped by the SWP and made available to the EWA will not be subject to the "reset" provision.

Export Curtailments which Result in Increased Storage

Where a prescribed (b)(2) export curtailment results in a reduction in releases from upstream reservoirs and hence increased storage, the charge to the (b)(2) account will be offset to the extent that the increased storage will result in increased delivery (beyond forecast delivery at the time of the export curtailment) to export users in the remainder of the water year. Where the delivery to export users in the reminder of the water year will not be increased, there will be no offset to the charge to the (b)(2) account.

Smelt Biological Opinion Ratio

The project description will contain the SWP's voluntary undertaking to meet the 2:1 ratio in the delta smelt biological opinion, using the 500 cfs pumping increase and\or other sources of water.